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BIOLOGICAL CLASSIFICATION OF MARINE ORGANISMS

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Curatorial Care of Biological Collection

Content:

- This slide discusses the nature of biological collections and outlines strategies for their long-term care and preservation.

Outline

- **Section I** : The Nature of Biological Collections
- **Section II** : Types of Biological Collections:
    1. **Dry Biological Collections**
    2. **Wet Biological Collections**
    3. **Biological Low-Temperature Collections**
    4. **Biological Microscopy Collections**
- **Section III :** Preservation of Biological Collections in General

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SECTION I:
THE NATURE OF BIOLOGICAL COLLECTIONS

What are biological collections?

Biological collections are typically:

- **preserved** plant or animal specimens
- specimen **documentation**, such as labels and notations

Maintained as separate collections based on:

- the **types of specimens**
- the **type of preservation**
- differences related to management, care, and use

What types of specimens are included in biological collections?

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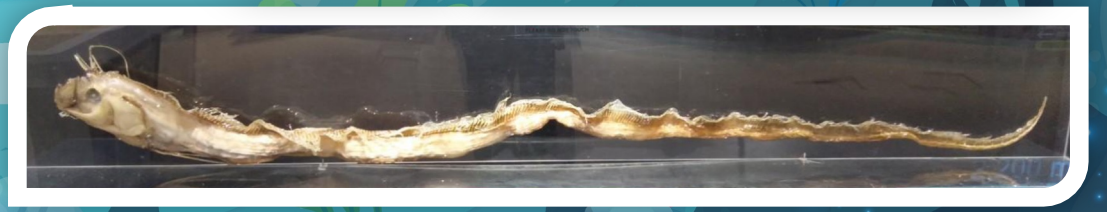
Plants		Animals	
Non-vascular Plants	**Vascular Plants**	**Invertebrates**	**Vertebrates**
• Aquatic - algae • Terrestrial - fungi - lichens - mosses	• Gymnosperms - conifers • Angiosperms - flowering plants	• Porifera - sponges • Cnidaria - jellyfishes - corals, sea fans, anemones • Ctenophora - comb jellies • "Vermes" - various phyla of worms and leeches • Arthropoda - crustaceans - spiders and mites - horseshoe-crabs - insects - centipedes and millipedes • Mollusca - snails, slugs, abalones - clams - squid, octopuses, nautiluses	• Fish • Amphibians and Reptiles • Birds • Mammals

What is the value of biological collections?

- ***Types*** (specimens referred to in the first published account of a new taxonomic group)
- **endangered** or **extinct** species
- specimens of **special historical** value
- specimens **rarely found** in any collections



Remember:

The basic reason for maintaining biological collections is to promote their use in both science and education.

Does preservation method affect use?

Yes, the method of specimen preservation has an impact on collection use.

- **Dry preservation** is useful for visual examination of characteristics, particularly where a degree of color and some delicate parts are important.

- **Fluid preservation** may sacrifice color but is useful for preserving internal organs that might be exposed by dissection.

Remember:

Because there is no single preservation method that will accommodate all possible uses of a specimen, a collection often includes specimens preserved by different methods.

How should I manage biological collections?

- **Ensure that they are available for use.**
- Provide proper care, document and use
- The **best**:
  - preservation methods
  - preservation materials
  - collection environments
  - handling practices
  - storage designs
  - emergency salvage
  - condition reporting
  - collection treatments

How should I handle biological specimens?

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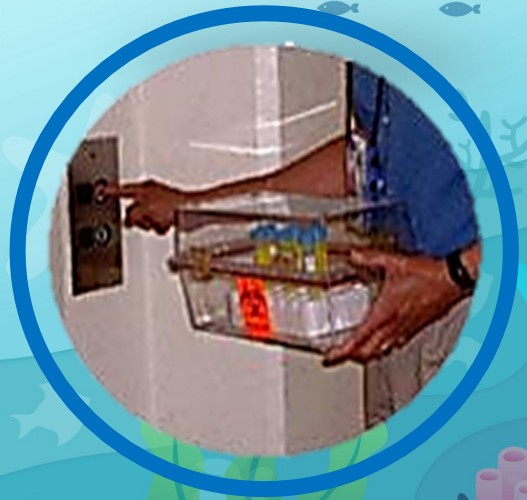
- Some specimens may have **special handling** requirements.
- Handle specimens as **infrequently** as possible.
- Handle each specimen as though it's **irreplaceable** and the most specimen **valuable** in the collection.
- **Never** smoke, eat, or drink while handling specimens.
- **Don't wear** anything that may damage the specimen.
- **Never hurry** when handling specimens. Move slowly.

How should I handle biological specimens?

- **Save all information** that is associated with the specimen, such as tags and labels.
- **Know the condition** before moving it.
- Lift and/or move the specimen by **supporting its strongest** structural component.
- Use a **utility cart with padded shelves** and **raised sides** to transport specimens from one room, area, or building to another.
- Use **only a pencil** when examining specimens.
- **Handle** only **one specimen** at **a time** and use both hands.

Safety during handling



Safety during handling

1. Taking material from the wild into collections:
   - ➔ Need quarantine **min 24h**
   - ➔ Prevent yourself from sting, spine, poison animals such as jellyfish, sea snake, stingray, etc
   - ➔ **(use proper equipment and PPE)**
2. Processing sample in lab:
   - ➔ Prevent from toxic type chemical,
   - ➔ Prevent from any infection fungal, parasite, bacteria, insect, or virus from sample **(wear proper PPE)**
3. Staff **properly dispose** of all parts discarded during the preservation process (such as internal organs of vertebrates preserved as dried skins) in the **biohazard dustbin**.
4. **Disinfect yourself and working area** each time after handling sample using disinfection reagent such as Clorox bleach or Dettol.

SECTION II:
TYPES OF BIOLOGICAL COLLECTIONS

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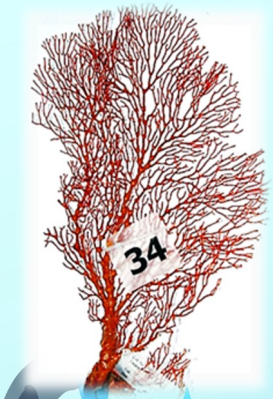
Types of collection

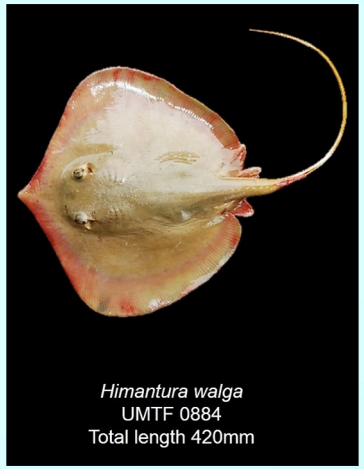
1. **DRY BIOLOGICAL COLLECTIONS**
2. **WET BIOLOGICAL COLLECTIONS**
3. **BIOLOGICAL LOW-TEMPERATURE COLLECTIONS**
4. **BIOLOGICAL MICROSCOPY COLLECTIONS**

1. DRY BIOLOGICAL COLLECTIONS



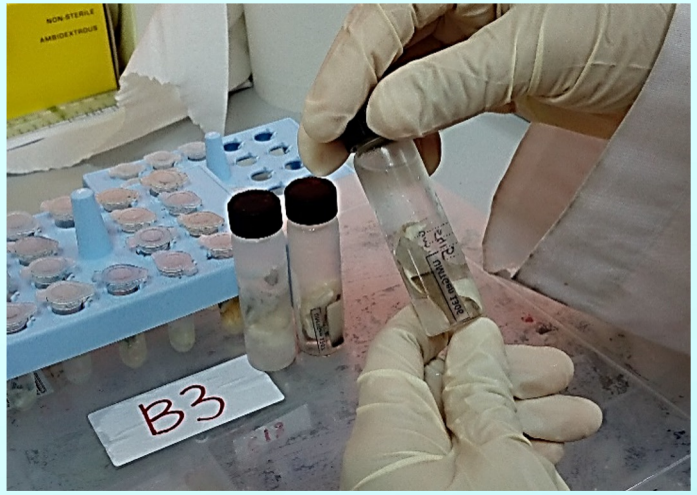
Dry collections consist of those specimens that are **preserved in a dry state**.

2. WET BIOLOGICAL COLLECTIONS



Wet collections are specimens **kept in a liquid preservative (such as ethanol, buffered formalin, and glycerol)** to prevent their deterioration.

3. BIOLOGICAL LOW-TEMPERATURE COLLECTIONS



- Specimens are maintained at low temperatures to preserve:
  - soft parts for various biochemical analyses (such as DNA)
  - whole organisms in a viable (able to live and grow) state

What low temperatures are used?

- **Cold Storage** includes temperatures above the freezing point of water (a range of 2°-8°C)
- **Freezer Storage** includes temperatures between 0°C and -80°C. For temporary storage.
- **Ultracold Storage** at about -80°C is used for short-term preservation of non-viable samples, such as animal tissue samples.
- **True Cryogenic Storage** includes temperatures that are usually below -130°C and considered to be optimum for preservation.

4. BIOLOGICAL MICROSCOPY COLLECTIONS

Specimens from a diverse range of plant taxa, include leaf surfaces and sections, pollen, wood, roots and chromosomes; animal taxa include parasites, fish diseases, planktons and larvae.

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SECTION III:
PRESERVATION OF BIOLOGICAL COLLECTIONS

Overview

Includes the four basic stages of preservation:

1. **Stabilization,**
2. **Processing,**
3. **Storage,** and
4. **Maintenance.**

Includes 4 basic stages of preservation:

1. **Stabilization**: preservation activities associated with halting active deterioration and minimizing the risk of loss, damage, or disorder as it relates to the specimen and its associated information.

2. **Processing**: preservation activities beyond stabilization that are related to making the specimen available for use.

3. **Storage**: preservation activities associated with housing of the specimens for the sake of access, organization, and protection.

4. **Maintenance**: preservation activities associated with corrective actions in response to a real or perceived problem.

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Thank you

NPS *Museum Handbook*, Part I (2005)